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FEEDING OF THE RINGED SEAL OF THE EUROPEAN NORTH OF THE USSR

Yu. I. Nazarenko

One of the objects of the hunting industry in the North of the USSR /81* is the ringed seal (Pusa hispida), which in recent years has come to be a major source of fur, leather, grease and meat.

As the hunt for this seal has expanded, it was claimed, for some unknown reason, evidently for the example of the Caspian Sea, that the ringed seal feeds on many commercial fishes and thus affects their approaches and abundance.

Being engaged in the study of the ringed seal, we naturally treated these claims with due seriousness, having gathered considerable data on its feeding.

There are rather few data on the feeding of the ringed seal in the literature. This is because the majority of stomachs dissected in seals obtained are usually empty. It is unlikely that all, or at least the majority, of dissected animals had not fed. The following is a more logical explanation. Seal traps are inspected once a day. The seal gets tangled in the net and dies, but the body, covered with a layer of fat, stiffens slowly, while the gastric juice continues to flow. As a result, by the time the stomach is

*The numbers in the right-hand margin indicate the corresponding pages in the original. - Transl.

Canada

dissected the food has been digested. It is the same in seals which have been shot on ice or on rocks where they lie for a long time. Evidently for this reason, G.A. Pikharev (9) writes: "Food or food remains were found in stomachs of Pusa hispida ochotensis Pall. only in animals which were killed afloat or which had just climbed out onto ice. As a rule, the stomachs were empty in all seals which had been lying around and dried up". T.M. Ivanov (7) reports the same with respect to the Baikal ringed seal: "The reasons for the lack of study of feeding lie not only in lack of attention to this problem, but also in the fact that stomachs of seals taken at any time of the year hardly ever contain food remains". A.S. Sokolov mentions the rapid digestion of food in the Ladoga seal (11). Taking this into account, in taking feeding samples, the seals must be dissected immediately after kill.

The feeding of the ringed seal is comprised by fishes, echinoderms, mollusks and crustaceans. This varied feeding is mentioned more than once in the literature (1, 8, 10, 4, 12, 14, 6). These works show that fish is the main food of the ringed seal, other objects (crustaceans, mollusks, etc.) to a lesser extent.

Fish bones, especially ribs, and less often flesh are found most often in /82
dissected stomachs. Fish otoliths are digested more slowly and are found in almost all stomachs. T.M. Ivanov (7) found 794 otoliths in the stomach of one Baikal ringed seal. Since otoliths are digested slowly and can accumulate in the stomach in time, their number is not indicative of the [amount of] fish consumed by the seal at one time. One can determine from them only the species of fishes on which the ringed seal has fed.

G.A. Pikharev (9) considers that the Far-Eastern Okhotsk ringed seal does not swallow large fishes whole, but tears them into pieces

before swallowing. But what is meant here by "large fishes": 25 cm is not much for an Atlantic salmon, but is practically the limit for a navaga. We found in a ringed seal stomach (October 1964, White Sea) an almost totally preserved fish skeleton 26 cm long with remains of flesh. Another 6 preserved smaller skeletons were found together with it.

In the course of evolution, ringed seals, like other marine mammals, arrived at a state where all the fatty deposits are concentrated only under the skin over the entire body, even including the snout and the tips of the flippers and serve as a reliable insulation from the cold environment.

Fat accumulates in the summer and fall, and is expended in the winter and spring, when a shortage of food is usually felt and the important biological processes of reproduction and moulting, which require enormous amounts of energy, take place. Helminths develop most strongly at this same time.

The ringed seal consumes much energy by its active behaviour, and fats are the main energy sources. The ringed seal must consume large amounts of food to maintain its normal activity. For example: in a seal killed afloat (May 1966, White Sea), the food lump in the stomach, after being cleaned of mucus and strained, weighed 1500 g and consisted of slightly digested remains of sand lance, capelin, Calanus and euphausids. The ringed seal was young (3 years) and small (116 cm).

One ringed seal, also killed while afloat and quickly gutted, was found to contain swallowed entomostrachans in the entire esophagus, while the stomach contained fish (White Sea herring) which had just been eaten.

We examined seal stomachs taken in different regions of the White and Barents seas, directly offshore and at some distance from shore. In all, 196 stomachs were dissected, in 91 of which food was found (46.4%).

Almost the same percentage was found in the Ladoga ringed seal (11).

Here is a brief account of our materials:

January 1962. Cheshkii Bay. Trap nets. 12 stomachs dissected, arctic cod in various stages of digestion found in two. Single otoliths were found in all stomachs.

May 1963. Western coast of Novaya Zemlya. Stomachs were dissected of three ringed seals shot while afloat. Food was found in only one stomach. It was identified as shrimp and plankton remains.

December 1963 - January 1964. Barents Sea, "Topseda". Trap nets. 95 stomachs opened up, food found in 76. The food consisted of flounder, navaga, smelt, arctic cod; mollusks were found in two stomachs. Pebbles were found in three stomachs. The navaga catch was very good at this time at the fishing grounds; the other fishes were caught very incidentally. However, navaga did not predominate over other fishes to any extent in /83 stomachs.

October 1964. White Sea, Lopshen'ga. Trap nets. 70 stomachs opened, food found only in seven. The food was most diverse in this case: sponge, gastropods Amphipoda, Decapoda, Anonym nugax, Gammarellus homari and Sabinea septemcarinata.

February 1965. Barents Sea. "Topseda". 11 stomachs opened (trap nets). Food found only in one - remains of flounder skeleton and 22 otoliths. Single otoliths, 6-9 in all, were found in the other 10 stomachs.

April - May 1966. White Sea. 5 seal stomachs opened. Food found in 4. The food consisted of spawning capelin, sand lance, shrimp Paudalus annulicornis, mollusk gastropods Buccinum Sp. gastropoda, and hydroids

Hudereides abietinaria abictuna. Food was found in animals taken afloat and which had just climbed out onto ice; the stomach was empty in one ringed seal which had been lying about*.

Analysis of these materials showed the following pattern: crustaceans predominate in food in summer both in number and weight; fish predominates in the winter. Fish predominates in the littoral, crustaceans in the open sea.

Comparison of published and our own findings shows that the ringed seal feads mainly on secondary fishes of little commercial value, followed by crustaceans. Valuable commercial fishes are not important in its feeding. The following example is typical. Sizeable accumulations of ringed seal have never been observed at a place of concentrated approach of Atlantic salmon in the North, such as the mouth of the Pechora R. On the Summer Shore** of the White Sea (October 1964), seal trap nets and Atlantic salmon nets ("tainiki") were situated close to each other, but a wounded salmon ("zverokhvatka") was never caught, although there were daily seal and salmon catches here.

Nevertheless, a number of published works and official statements claim very definitely that the ringed seal is a pest of the fishery. As a consequence, it is proposed that its industry be prosecuted most vigorously everywhere, with no limit on time or methods, and that a bounty be paid for each seal taken in addition to the production cost. There is usually a reference to the experience and practice of Finland in Lake Ladoga. We do not know on what facts these claims are based, since they are never cited. In our opinion, such measures in practice amount to the extermination of this seal.

*In all cases, the species identification of stomach contents was done by workers of the Laboratory of the Biology of the Sea of the Polar Institute of Fisheries and Oceanography. The author is grateful to them.
**North shore of Onega Peninsula.-Transl.

As we have already mentioned, out findings indicate that the ringed seal feeds in the absolute majority on fishes which are few, of little value and, most importantly, little used by man, such as the arctic cod, capelin and sand lance. In addition, some investigators, K.K. Chapskii /84 (14) for example, not without grounds consider that entomostrachans are the basic food of the ringed seal.

The mass approaches of fishes like the capelin, arctic cod and herring on which the ringed seal feeds, are usually annual, and the seal can in no case have any substantial or even noticeable effect on the abundance of these fishes. The fishermen which we interviewed were of the same opinion, though in many cases they theought that the seal frightens off the fish.

In general, industry representatives are trying to ascribe the curtailment of fishing stocks to ringed seals. The situation in the Caspian Sea, as described by B.I. Badamshin (2) is very typical in this respect. Without repeating what he has written, it can be summed up briefly as follows: in the Caspian, there was previously an abundance of both seals and fish; now there is little of either.

We must also keep in mind that in recent years the negative importance of predators has been reconsidered and in many cases their role is now seen as positive (pole cat, pike, otter, predatory birds, etc.). The grey seal was considered a dangerous predator in Enland and a bounty was paid for it; now it is a protected species because ichthyologists have noted a distinct deterioration in the viability of fishes.

The ringed seal consumes fish, but we must see in this primarily its role as an important natural sanitizer, a factor of natural selection helping fish populations to fluorish.

In all of natural history, there does not appear to be a case where any one species has been responsible for the extinction of another, but one can ascribe many such cases to man.

The Swedish naturalist Sven Iil'seter*(15) writes: "The surprisingly rich animal world of the North developed by the laws of nature herself, laws which we humans, the most pitiless creatures on the Earth, like to call cruel". It will be very sad if Man's economic activity negatively affects nature in the North.

The current state of ringed seal stocks in the European North of the USSR allows for a considerable increase in the take. But we must approach the ringed seal as an animal providing valuable output, and not as a harmful predator; we must aim at a constant high abundance of the species, not its extermination.

SUMMARY

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The stomachs of the ringed seals, caught with nets and shot on the ice were empty in most cases (53,6%). This fact may be explained by a strong influence of the gastric juice. If the ringed seals are shot in the water and immediately dissected feeding components are always found in their stomachs as well as otoliths, the rate of their digesting is slow and they accumulate in the stomachs with time.

In summer, crustaceans prevail in the food of the ringed seal while in winter, they feed mostly on fish. In their stomachs there were found fish skeletons 26 cm in length, and the total weight of food lump was about 1,5 kg.

One must not consider the ringed seal harmful for fish industry as they feed on numerous fish of small value and use (capelin, polar cod and sand eel), their function of a natural sanitar is also important as it favours the growth of fish populations.

*Spelling approximate.-Transl.

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*Spelling approximate. - Transl.